The observations made on that occasion will soon be published in the United States Monthly Weather Review of the Weather Bureau. Unfortunately, they do not sensibly increase our knowledge of the oblique arcs of the anthelion, whose mode of production remains obscure. By examining closely what has been stated by Bravais, Mr. Besson has determined that he can account for only the short arcs, deviating a little from the anthelion upward, but not at all for those which extend as far as the region of the sun. It is very desirable that at their next appearance the oblique arcs of the anthelion be observed with more precision and more detail than previously. A photograph, especially in the case of short arcs, will be the most instructive document. If the arcs are long, it will be proper to give attention to the following points:

Are these true arcs of the circle, or, in other words, is their curve uniform and, in this case, what is their radius of curvature?

What is the angle between them at their point of crossing over the anthelion?

At what distance from the zenith do they pass?

At what point of the sky do they recross?

Is this exactly on the sun?

It is indispensable to note the exact time when the observation was made, for the character of the phenomena must vary with the height of the sun.

Mr. Lemoine thinks that it would be advantageous, in the study of halos, not to confine ourselves to observation, but to consider also methods of experimentation. With the present resources of our laboratories we can reasonably produce artificially various crystalline forms of ice and study their optical properties.

Mr. Besson says that he shares entirely the opinion of Mr. Lemoine, and that he has never neglected an opportunity to point out to physicists and to laboratory crystalographers the experimental study of the crystallization of ice as an interesting and certainly profitable study, but up to the present time he has not succeeded in interesting any one who possessed the necessary equipment.

On the other hand, he took occasion to remark that, in the study of halos, observation and experiment each has its own domain—the first alone can make known to us the natural phenomena to be explained; the second is for the purpose of teaching us the various possible forms of ice crystals and showing us which can best account for the optical appearances.

Mr. Goutereau recalls that Mr. Besson, in his researches on halos, had recourse to experimentation to determine the orientation that ice crystals take in falling.

HALOS IN FEBRUARY, 1914.

The following report by Daingerfield of the halo seen on February 6, 1914, at Pueblo, Colo., and again the reports by Flora, Holcomb, and Judy of the halo seen on February 24, 1914, in Kansas, are reprinted from the respective Monthly Section Summaries by request of Prof. C. F. Talman, as referring to rarer forms of halos and of interest to students of halo phenomena.—[C. A.]

REMARKABLE HALO AT PUEBLO, COLO., FEBRUARY 6, 1914.

Mr. L. H. Daingerfield, Local Forecaster, Pueblo, Colo., sends a report and drawings of a remarkable solar halo observed at that place between sunrise and 9 or 9:30 a. m., February 6, 1914, by Mr. W. F. Doertenbach, Mr. J. K. Sweeny, and himself. The phenomenon included a complete and brilliantly colored halo of 22° radius around the sun, part of a fainter halo of 46° radius, a complete parhelic circle, a brilliant circumzenithal arc, parhelia of 22° and 46°, and a sun-pillar forming a cross with the parhelic circle. Fragments of another heliocentric halo, described as about 66° from the sun, with paranthelia at their point of intersection with the parhelic circle, are also mentioned in the report. As these arcs do not agree in position with any known form of halo and as the report states that "the color may have been altogether white," it seems possible that these were fragments of the halo of Hevelius (the 90° halo).

One of the drawings (none of which are reproduced) sent by Mr. Daingerfield shows the circumzenithal arc forming a complete circle, also an arc of a halo of about 22° radius, prismatically colored, surrounding the point opposite the sun in azimuth, as well as certain other features that do not correspond with any forms of halo heretofore recorded. It also shows four paranthelia, two at the point of intersection of the small halo opposite the sun with the parhelic circle, and two on the parhelic circle about 60° from the antisolar point. This drawing appears to be a composite of the observations of several persons.—[C. F. T.]

UNUSUAL SOLAR HALOS SEEN IN KANSAS ON FEBRUARY 24, 1914.

Solar halos of unusual appearance were observed in eastern, northern, and central Kansas on February 24, 1914, from 9 a. m. to 10 a. m., and sun dogs (parhelia) of considerably more than usual brilliancy were seen from

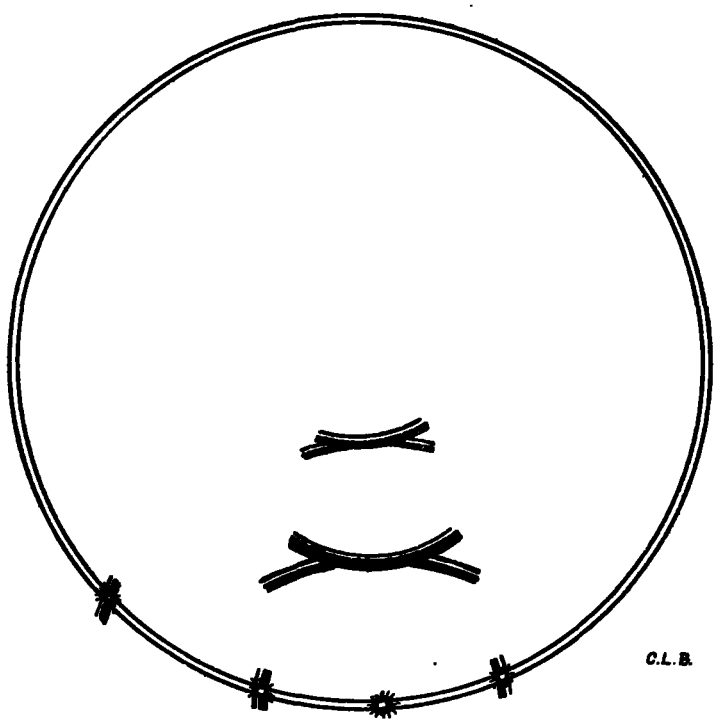

FIG. 1.—Solar halos seen at Topeka, Kans., February 24, 1914, between 9:30 and 10 a. m. (90th meridian time).

4 to 5:30 p. m. of the same day over the northern and central portions of the State.

From the meager descriptions received it is believed that halos reported at Hoxie, Kans., Beloit, Wis., Minneapolis, Minn., and Council Grove, Kans., were similar in